



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE
GOVERNOR

PAUL MERCER
COMMISSIONER

**Acadia Hospital, Corp.
Penobscot County
Bangor, Maine
A-234-71-N-A**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #1**

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (M.R.S.A.), §344 and §590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Acadia Hospital, Corp. (Acadia Hospital) was issued Air Emission License A-234-71-M-R on March 30, 2015, for the operation of emission sources associated with their healthcare facility.

Acadia Hospital has requested an amendment to their license in order to remove Boiler #3 from their license and add a combined heat and power (CHP) internal combustion engine to their license.

The equipment addressed in this license amendment is located at 268 Stillwater Avenue, Bangor, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Generator

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (kW)	Fuel Type, % sulfur	Firing Rate (scf/hr)	Date of Manuf.	Date of Install.
CHP #1	0.95	75	Natural gas, negl.	930	2016	2016

Additionally, Boiler #3 has been removed from the site and is hereby removed from this air emission license.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

C. Application Classification

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the "Significant Emission" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (CMR) 100 (as amended). The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

<u>Pollutant</u>	<u>Current License (TPY)</u>	<u>Future License (TPY)</u>	<u>Net Change (TPY)</u>	<u>Significant Emission Levels</u>
PM	3.3	3.0	-0.3	100
PM ₁₀	3.3	3.0	-0.3	100
SO ₂	0.1	0.1	+0.0	100
NO _x	7.2	15.7	+8.5	100
CO	5.6	20.3	+14.7	100
VOC	0.6	0.6	+0.0	50
CO ₂ e	<100,000	<100,000	-	100,000

This modification is determined to be a minor modification and has been processed as such.

II. **BEST PRACTICAL TREATMENT (BPT)**

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

B. CHP Unit

Acadia Hospital plans to begin operation of a new CHP unit (CHP #1) in September 2016. For licensing purposes, CHP #1 is considered a non-emergency generator. CHP #1 has a generator set consisting of an engine and an electrical generator in addition to a heat recovery system to capture the excess thermal energy and use it for

building heat. CHP #1 has an engine rated at 0.95 MMBtu/hr and a rated output of 75 kW which fires natural gas. CHP #1 was manufactured in 2016.

1. BACT Findings

a. Particulate Matter (PM, PM₁₀, and PM_{2.5}) and Sulfur Dioxide (SO₂)

The emissions of PM/PM₁₀/PM_{2.5} and SO₂ from combustion of natural gas in units that are properly operated and maintained are inherently low due to the low ash content and negligible sulfur content of natural gas. Additional controls to reduce emissions of PM/PM₁₀/PM_{2.5} and SO₂ below current levels would not be economically practical given the small size (0.93 MMBtu/hr) of the unit. The Department finds proper operation and maintenance and the firing of natural gas to constitute BACT for PM/PM₁₀/PM_{2.5} and SO₂ emissions from CHP #1.

b. Nitrogen Oxides (NO_x), Carbon Monoxide (CO), and Volatile Organic Compounds (VOC)

Emissions of NO_x, CO, and VOC from small natural gas-fired internal combustion engines are typically controlled through proper operation and maintenance according to the manufacturer's emission-related instructions. Per manufacturer specifications, this unit comes equipped with a three-way non-selective catalytic reduction emissions control package that includes two catalytic converters, temperature and oxygen sensors, and controls designed to reduce emissions of NO_x, CO, and VOC.

The Department finds that proper operation and maintenance according to the manufacturer's instructions and use of the unit's emission control package constitute BACT for emissions of NO_x, CO, and VOC from CHP #1.

2. Emission Limits

The BACT emission limits for CHP #1 are based on the following:

PM/PM ₁₀ /PM _{2.5}	- 0.05 lb/MMBtu based on 06-096 CMR 115, BACT
SO ₂	- 0.000588 lb/MMBtu based on AP-42, Table 3.2-3, dated 7/00
NO _x	- 2.27 lb/MMBtu based on AP-42, Table 3.2-3, dated 7/00*
CO	- 3.72 lb/MMBtu based on AP-42, Table 3.2-3, dated 7/00*
VOC	- 0.0296 lb/MMBtu based on AP-42, Table 3.2-3, dated 7/00
Opacity	- 06-096 CMR 115, BACT

*Based on the worst case emission factor from AP-42.

The BACT emission limits for CHP #1 are the following:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
CHP #1 Natural gas	0.05	0.05	0.05	negl.	2.16	3.53	0.03

Visible emissions from CHP #1 shall not exceed 10% opacity on a six-minute block average basis.

3. 40 CFR Part 60, Subpart JJJJ

The federal regulation 40 CFR Part 60, Subpart JJJJ, *Standards of Performance for Spark Ignition Internal Combustion Engines (SI ICE)* is applicable to CHP #1 since the unit was ordered after June 12, 2006, and manufactured after January 1, 2009. [40 CFR §60.4230] By meeting the requirements of Subpart JJJJ, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ. [40 CFR §63.6590(c)]

40 CFR Part 60, Subpart JJJJ Requirements

a. Manufacturer Certification Requirement

CHP #1 shall be certified by the manufacturer as meeting the emission standards for new nonroad spark ignition engines found in 40 CFR Part 60, Subpart JJJJ, Table 1. [40 CFR §60.4233(e)]

b. Operation and Maintenance Requirement

CHP #1 shall be operated and maintained according to the manufacturer's written instructions or procedures developed by Acadia Hospital that are approved by the engine manufacturer. Acadia Hospital may only change those settings that are permitted by the manufacturer. Additionally, Acadia Hospital shall maintain and operate the air-to-fuel ratio controller appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [40 CFR §60.4243(b)(1) and §60.4243(g)]

c. Recordkeeping

Acadia Hospital shall keep records that include maintenance conducted on CHP #1, the quantity of fuel fired in CHP #1, manufacturer certification that CHP #1 meets the emission standards found in 40 CFR Part 60, Subpart JJJJ, Table 1, and all notifications related to CHP #1, including supporting documentation. [40 CFR §60.4245(a)]

C. Annual Emissions

Total Annual Emissions

Acadia Hospital shall be restricted to the following annual emissions, based on a calendar year total. The tons per year limits were calculated based on unlimited firing of natural gas in the boilers and in CHP #1 and operating Generator #1 for 100 hr/year:

Total Licensed Annual Emissions for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	PM₁₀	SO₂	NO_x	CO	VOC
Boiler #1	1.4	1.4	-	2.7	2.3	0.2
Boiler #2	1.4	1.4	-	2.7	2.3	0.2
Generator #1	-	-	0.1	0.9	0.2	0.1
CHP #1	0.2	0.2	-	9.4	15.5	0.1
Total TPY	3.0	3.0	0.1	15.7	20.3	0.6

III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 CMR 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM ₁₀	25
SO ₂	50
NO _x	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-234-71-N-A subject to the conditions found in Air Emission License A-234-71-M-R and the following conditions.

Severability. The invalidity or unenforceability of any provision of this License Amendment or part thereof shall not affect the remainder of the provision or any other provisions. This License Amendment shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

Specific Condition (16) of Air Emission License A-234-71-M-R (issued March 30, 2015) shall be replaced with the following Specific Condition:

(16) Boilers

A. Fuel

1. Boilers #1, #2, and #3 are licensed to fire natural gas. [06-096 CMR 115, BPT]
2. Boilers #1 and #2 are licensed to fire distillate fuel within the confines of the definition of a "gas-fired boiler" as defined by 40 CFR §63.11237. [06-096 CMR 115, BPT]
3. Prior to July 1, 2018, Acadia Hospital shall fire distillate fuel with a maximum sulfur content not to exceed 0.25% by weight in Boilers #1 and #2. [06-096 CMR 115, BPT/BACT]
4. Beginning July 1, 2018, Acadia Hospital shall not purchase or otherwise obtain distillate fuel with a maximum sulfur content that exceeds 0.0015% by weight (15 ppm) for use in Boilers #1 and #2. [06-096 CMR 115, BPT/BACT]
5. Compliance with the distillate fuel sulfur limits shall be demonstrated by fuel records from the supplier showing the quantity, type, and percent sulfur of the fuel delivered. Acadia Hospital shall keep records of all oil firing including dates, duration, and reason for operating Boilers #1 or #2 on distillate fuel. [06-096 CMR 115, BPT]

B. Emissions shall not exceed the following:

<u>Unit</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>Origin and Authority</u>
Boiler #1 Natural gas	PM	0.05	06-096 CMR 115, BPT
Boiler #1 Distillate Fuel	PM	0.08	06-096 CMR 115, BPT
Boiler #2 Natural gas	PM	0.05	06-096 CMR 115, BPT
Boiler #2 Distillate fuel	PM	0.08	06-096 CMR 115, BPT

C. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

<u>Unit</u>	<u>PM (lb/hr)</u>	<u>PM₁₀ (lb/hr)</u>	<u>SO₂ (lb/hr)</u>	<u>NO_x (lb/hr)</u>	<u>CO (lb/hr)</u>	<u>VOC (lb/hr)</u>
Boiler #1 Natural gas	0.32	0.32	negl.	0.62	0.52	0.03
Boiler #1 Distillate fuel	0.50	0.50	1.59	0.90	0.23	0.02
Boiler #2 Natural gas	0.32	0.32	negl.	0.62	0.52	0.03
Boiler #2 Distillate fuel	0.50	0.50	1.59	0.90	0.23	0.02

D. Visible Emissions

1. When only natural gas is being fired in the boilers, visible emissions from Stack #1 shall not exceed 10% opacity on a six-minute block average basis, except for no more than one six-minute block average in a three-hour period. [06-096 CMR 115, BPT]
2. When either Boiler #1 or Boiler #2 are firing distillate fuel, visible emissions from Stack #1 shall not exceed 20% opacity on a six-minute block average basis, except for no more than two six-minute block averages in a three-hour period. [06-096 CMR 115, BPT]

The following is a new Specific Condition to Air Emission License A-234-71-M-R (issued March 30, 2015):

(19) **CHP Unit**

A. Emissions from CHP #1 shall not exceed the following [06-096 CMR 115, BACT]:

Unit	PM (lb/hr)	PM₁₀ (lb/hr)	PM_{2.5} (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
CHP #1 Natural gas	0.05	0.05	0.05	2.16	3.53	0.03

B. Visible emissions from CHP #1 shall each not exceed 10% opacity on a six-minute block average basis. [06-096 CMR 115, BACT]

C. CHP #1 shall meet the applicable requirements of 40 CFR Part 60, Subpart JJJJ, including the following:

1. **Manufacturer Certification**

CHP #1 shall be certified by the manufacturer as meeting the emission standards for new nonroad spark ignition engines found in 40 CFR Part 60, Subpart JJJJ, Table 1. [40 CFR §60.4233(e)]

2. **Operation and Maintenance**

CHP #1 shall be operated and maintained according to the manufacturer's written instructions or procedures developed by Acadia Hospital that are approved by the engine manufacturer. Acadia Hospital may only change those settings that are permitted by the manufacturer. Additionally, Acadia Hospital shall maintain and operate the air-to-fuel ratio controller appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [40 CFR §60.4243(b)(1) and §60.4243(g)]

3. Recordkeeping

Acadia Hospital shall keep records that include maintenance conducted on the CHP #1, the quantity of fuel fired in CHP #1, manufacturer certification that CHP #1 meets the emission standards found in 40 CFR Part 60, Subpart JJJJ, Table 1, and all notifications related to CHP #1, including supporting documentation. [40 CFR §60.4245(a)]

DONE AND DATED IN AUGUSTA, MAINE THIS 31 DAY OF August, 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PAUL MERCER, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-234-71-M-R.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 7/21/2016

Date of application acceptance: 7/22/2016

Date filed with the Board of Environmental Protection:

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.

